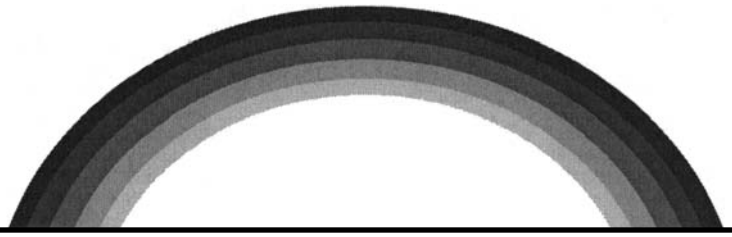
Disaster Recovery



Safety and Health

What you need to know about silo gas, a deadly killer

Flooding and wet conditions may reduce grain crops to no more than vegetation for silage this year. If you plan to produce silage, be on the lookout for silo gas, an almost invisible gas that can cause extensive lung damage and death with only a few breaths.

Here are answers to common questions about silo gas, how to recognize it and protect yourself from its dangers.

What is silo gas?
Silo gas is a toxic, natural by-product of silage production. It is composed of oxides of nitrogen that are produced when chopped plant material ferments. Silo gas collects in upright silos within a few hours to two weeks after fresh material is ensiled. It can reach dangerously high levels the first two weeks after a silo is filled.

Silo gas is most prevalent in upright silos that are not air-tight. It can form in earthen pits or temporary silage areas, but open air usually prevents silo gas from reaching dangerous levels.

How can I detect silo gas?
Silo gas is almost invisible but you may see it as a yellowish or reddish haze hanging just on top of silage. You also may be able to detect red, yellow, or brown staining of silage or other surfaces, or its bleach-like odor.

Silo gas is heavier than air, and it will settle on top of the silage and in any depression or cavity in the silage. It will travel down the silo chute and collect in adjoining buildings, including feed rooms, barns, and other areas at the bottom of the chute.

If you detect any signs of silo gas, leave the area immediately. You may not notice adverse physical reactions to the gas until the next day, after lung damage already has occurred. Relapses two to six weeks after the original episode also are common.

Why is silo gas dangerous?
Silo gas is toxic and it depletes the amount of breathable air inside an enclosed area. It is mildly irritating to the nose, throat and airways, and can cause the lungs to fill with fluid. The severity of reaction depends on how much gas is inhaled, and for how long. Inhaling a low concentration for a long time can be just as harmful as inhaling a high concentration for a few seconds.

The most common and least severe reaction to silo gas includes eye irritation and a cough. This can be accompanied by labored breathing, fatigue, nausea, bluish skin coloring, vomiting, dizziness, or sleepiness. Problems occur when a worker overlooks minor symptoms and continues to work in an unhealthy environment. The result can be inflammation of the lungs, known as silo filler's disease.

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Breathing very high concentrations of silo gas can cause a person to collapse and die within minutes. Even if that person survives, he or she later may develop silo filler's disease.

See your doctor immediately if you think you've been exposed to silo gas, or have any symptoms, even if they are mild or do not persist. Symptoms also may be delayed for 3 to 30 hours after exposure to silo gas.

How can I protect myself from silo gas?
Only a self-contained breathing apparatus (SCBA) worn by firefighters will protect you from silo gas. However, this equipment is expensive and requires special training. The cardinal rule is to **never enter a silo until at least 14 days after filling** when dangerous levels of silo gas may be present.

To reduce the amount of silo gas that can form, fill the silo quickly and as full as you can. Keep a blower running to provide as much air movement as possible during this time. Several days before starting to use silage, pull the cover off the filler opening from the ground with a rope to avoid having to climb up the chute.

To protect others from silo gas:

- Post warning signs in a conspicuous location near the silo.
- Keep children and animals away from the silo base and feed room during filling and for at least two weeks after filling.
- After filling, keep the door between the feed room and barn closed and secured.

Do some plant materials produce more silo gas than others?
Yes. Plant nitrate content greatly affects silo gas formation in the silo or storage structure. Weeds, corn, sudangrass and sorghum store a higher level of nitrates than typical silage crops such as alfalfa. High levels of nitrogen also are produced during wet, cloudy, and cool growing seasons.

If you have questions about proper silage procedures, or whether your crops are suitable for silage, contact your local extension office.

Prepared by Charles V. Schwab, ISU Extension safety specialist, Laura Miller, former extension communications specialist. Adapted from *Oxides of Nitrogen (Silo Gas),* Pm-1222-5, from the Agricultural Respiratory Hazards Education series produced by the University of Iowa and the American Lung Association.

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